

Printed pages:

EEEC101.

(Following paper code and roll No. to be filled in your answer book)

Paper code:

Roll No.

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**B. Tech.**

ODD- ~~1st~~ Semester Examination, ~~2016-17~~ 2012-13

**Time: 3hrs.**

**Max. Marks: 100**

**Subject: Electronics Engineering**

- Note:** (1) Attempt ALL questions.  
(2) ASSUME ALL MISSING DATA.

**SECTION A**

1. Attempt all questions. [10\*2=20]
- (a) What is depletion layer in the context of semiconductor diode.
  - (b) Draw the V-I characteristic of a zener diode and explain how a zener diode regulates the voltage.
  - (c) How the two transistor junctions must be biased for proper operation of a transistor amplifier.
  - (d) Sketch in input and output characteristics (V-I) of a CE NPN transistor configuration with proper labels.
  - (e) What is major difference between a bipolar and unipolar device.
  - (f) What is the main difference between the construction of an enhancement type MOSFET and depletion type MOSFET?
  - (g) Write the properties of an ideal Op-Amp.
  - (h) What is BCD? Where it is used?

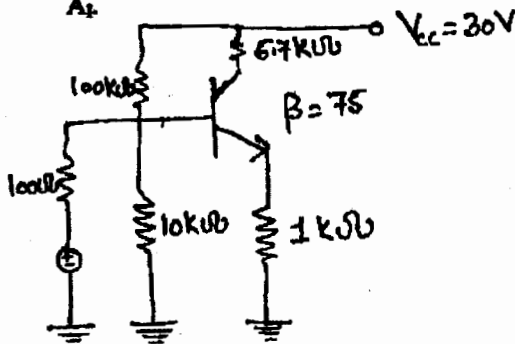
(2)

- (i) What maximum voltage can be measured by a 3 and  $\frac{1}{2}$  digit voltmeter having a resolution of 100mV?
- (j) Explain Karnough map (K-Map) and its use.

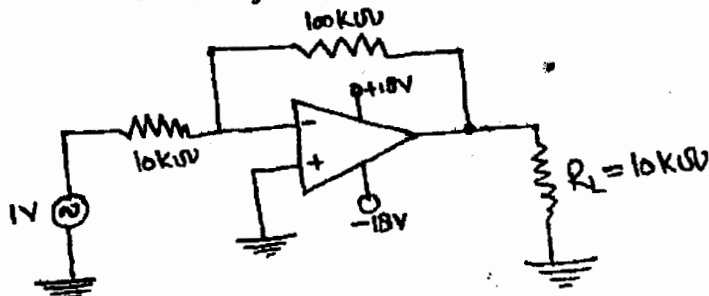
### SECTION B

2. Attempt any three of the following. All question carry equal marks. [10\*3=30]

- (a) What is ripple factor? Derive the expression of ripple factor. What is the value of ripple factor for half wave and full wave rectifier?
- (b) For single stage CE amplifier shown in figure. Calculate the following (i)  $A_v$ , (ii)  $R_i$  (iii)  $R_o$  (iv)  $A_f$ .



- (c) Draw and derive the expression for an integrator with an OP-Amp. For the circuit shown in figure, find the closed-loop gain, input impedance and common-mode rejection ratio.



(3)

- (d) Explain the working of CRO using neat block diagram. How voltage and frequency can be measured using CRO?

### SECTION C

3. Answer any TWO part of the following:

[5\*2=10]

- Explain the working of an enhance type MOSFET with help of Characteristic curves.
- Explain the application of zener diode as shunt regulator.
- Describe the biasing of transistors.

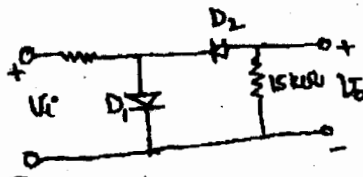
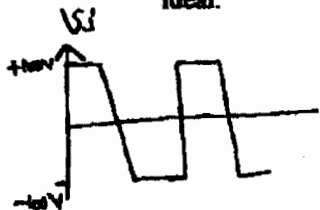
4. Answer any TWO part of the following [5\*2=10]

- Minimize the function given below using K-Map.

$$f(A, B, C, D)$$

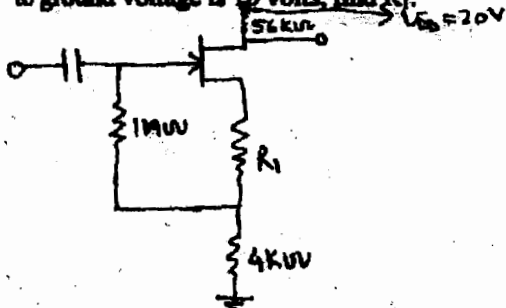
$$= \sum_m (0, 2, 3, 6, 7, 9, 12, 15) \\ + \sum d (1, 4, 10, 11)$$

- Explain the basic construction and principle of operation of JFET. Also explain the maximum drain saturation current.
  - Explain the working principle of digital voltmeter.
5. Answer any TWO part of the following [5\*2=10]
- Sketch the output voltage  $V_o$  for the circuit shown in figure, assume diodes  $D_1$  and  $D_2$  are ideal.



(4)

- (b) Explain the basic construction and principle of operation of BJT.
- (c) Explain the CS and CD configurations of JFET amplifiers.
6. Attempt any TWO of the following [5\*2=10]
- (a) The N-Channel JFET as shown in figure has  $I_{DSS}=1.5\text{mA}$ ,  $V_P=-1.5\text{V}$ . If the quiescent drain to ground voltage is 10 volts, find  $R_D$ .



- (b) Draw the equivalent circuit of a common emitter amplifier in terms of h-parameter also obtain the expression for (i) circuit gain (ii) voltage gain (iii) input resistance (iv) output resistance.
- (c) What is voltage multiplier using p-n junction diode? Explain the operation of voltage doublers.
7. Answer any TWO of the following [5\*2=10]
- (a) Construct logic circuits using INVERTER, AND and OR gates for the Boolean expression
- (i)  $X = \overline{C + AB}$
- (ii)  $Y = AB + \overline{BC}$
- (b) Perform the subtraction of the following unsigned binary numbers using the 2's complements of the subtrahend
- (i)  $(1101)_2 - (101100)_2$
- (ii)  $(11.01)_2 - (0001.1110)_2$